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Alberta
HUMAN RESOURCES
AND EMPLOYMENT

the people
& workplace
department

July 2003

Occupational Injuries and Diseases in Alberta

Construction
1998 to 2002

Alberta Construction Safety Association Industries

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Highlights

From 1998 to 2002…

- There were 31,714 lost-time claims from workers in the Alberta Construction Safety Association (ACSA) industries.
- Of the lost-time claims in the ACSA industries, 28% involved Drywall and Residential Construction and 25% Industrial Construction.
- Sprains, strains and tears were the most common nature of injury accounting for 43% of the total lost-time claims.
- The back was the most common body part injured accounting for one-quarter of the total claims.
- Almost one-third of the accidents involved bodily reaction and exertion in manoeuvring objects.
- More than half of the injured workers were 25 to 44 years of age.

In 2002…

- The Workers' Compensation Board – Alberta (WCB) accepted 6,602 lost-time claims from ACSA workers, representing 18% of all lost-time claims accepted by the WCB from all workers in the province.
- The lost-time claim rate for ACSA workers was 4.1 per 100 person-years worked. This was the lowest lost-time claim rate achieved between 1998 and 2002.
- The duration rate for all ACSA industries was 189 per 100 person-years worked compared to the provincial rate of 94 per 100 person-years worked.
- Roadbuilders had the lowest lost-time claim rate of all ACSA industries, at 2.9 per 100 person-years worked. Masonry had the highest lost-time claim rate of 7.5 per 100 person-years worked.
- Employers with 100 or more person-years worked had the lowest lost-time claim rate of 2.9 per 100 person-years worked.
- Six percent of all ACSA industries had a valid Certificate of Recognition.
- The WCB accepted 25 fatalities for compensation in all ACSA industries, representing one-quarter of all worker fatalities accepted in Alberta.

1. Introduction

Role of Alberta Human Resources and Employment

Alberta Human Resources and Employment (AHRE) is committed to investing in people and fostering safe and productive workplaces. AHRE develops and delivers programs and services which contribute to workplaces that are safe, healthy, fair and stable for employees and employers by:

- Working with industry and safety associations to audit and certify health and safety programs.
- Helping employers, employees, unions and industry associations work together by offering facilitation services, workshops and partnership opportunities.
- Developing and maintaining policy and legislated standards in Alberta.
- Preparing and providing ongoing support of Alberta's workplace health and safety regulations.
- Promoting safe, fair and healthy workplaces by explaining legislated standards and ensuring compliance.

Occupational Injuries and Diseases in Alberta Construction 1998 to 2002

Each year, AHRE prepares a summary of the Construction industries, based on the Alberta Construction Safety Association (ACSA), to provide a comprehensive picture of workplace health and safety.

This report includes:

- An estimation of the risk of injury or diseases (lost-time claim rate) in addition to descriptive information about the incidents and injured workers.
- Analysis of the lost-time injury and disease claims to provide a broader context for the lost-time injury and disease rate.
- The number of employers that earned a Certificate of Recognition (COR) as a result of an external audit.
- Occupational fatalities accepted by the WCB for compensation and fatality rate for the ACSA industries.
- Description of fatalities investigated by AHRE.

While this report focuses on 2002 data, information for 1998 to 2001 is also provided for comparison.

The purpose of this report is to provide government, employers, workers and health and safety officers in the ACSA industries with information about the industries' key health and safety issues.

Terms, definitions and formulas are described in Appendix A. Business rules are described in Appendix B and industry codes are listed in Appendix C.

2. Lost-Time Claim Rate and Duration Rate

The lost-time claim rate represents the probability or risk of a disabling injury or disease to a worker during a period of one year. The 2002 provincial lost-time claim rate[1] was 3.0 per 100 person-years worked.

In 2002, there were 6,602 lost-time claims in the ACSA industries, representing 18% of the 37,598 total lost-time claims in the province. All ACSA industries' lost-time claim rate was 4.1 per 100 person-years worked, a decrease of 4.7% from 2001 and the lowest rate over the last five years (see Table 2.0). The lost-time claim rate of 4.1 per 100 person-years worked translates to 21 injuries and diseases per million hours worked.

The duration rate is intended to reflect, in part, the economic impact of occupational injury and disease as reflected by the number of days off work per 100 person-years worked. In 2002, the ACSA industries had a duration rate of 189 per 100 person-years worked.

Table 2.0 Alberta Construction Safety Association Industries

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	27,279	$32,876,664	128,798	249,803	194	6,112	4.7
1999	28,609	$22,684,826	133,349	257,164	193	6,034	4.5
2000	29,900	$40,584,462	138,527	280,696	203	6,591	4.8
2001	31,641	$39,301,864	148,525	272,754	184	6,375	4.3
2002	33,296	$48,607,236	160,412	303,525	189	6,602	4.1

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

Between 1998 and 2002, there were 31,714 lost-time claims in all ACSA industries. Drywall and Residential Construction accounted for over one quarter of all ACSA industries' lost-time claims, followed by Industrial Construction, at 25%. The Masonry sub-sector experienced the fewest lost-time claims, at one percent, for all ACSA industries (see Chart 2.0).

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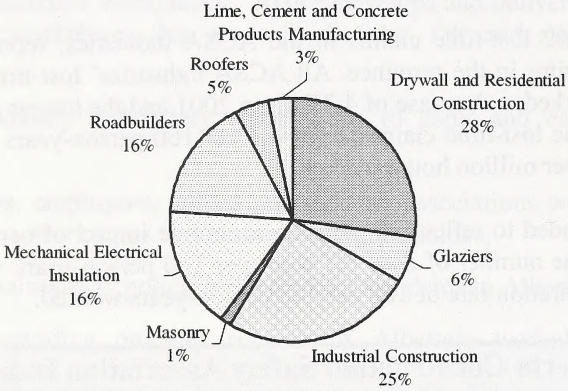
[1] The rate has been calculated from lost-time claims data as of March 31, 2003. This rate underestimates the risk of occupational injury and disease since some lost-time claims that occurred in 2002 were not administered by March 31, 2003.

Chart 2.0 **Lost-Time Claims by ACSA Industries**
Alberta: 1998 - 2002



Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

2.1 Lost-Time Claim Rate by Size of Employer

Employers with 100 or more person-years worked had the lowest claim rate of 2.9 per 100 person-years worked. Employers with less than 10 person-years and 10 to 19 person-years worked had the highest lost-time claim rate of 4.9 per 100 person-years worked (see Table 2.1).

Table 2.1 Lost-Time Claim Rate by Size[2] of Employer: 2002

Size of Employer	Number of Accounts	Lost-Time Claims	Estimated Person – Years	Lost-Time Claim Rate[3]
< 10 person-years	30,649	2,079	42,535	4.9
10 to 19 person-years	1,234	837	17,253	4.9
20 to 39 person-years	701	942	19,659	4.8
40 to 99 person-years	409	971	24,306	4.0
100 or more person-years	199	1,623	56,658	2.9
Unspecified	104	150	N/A	N/A
Total	33,296	6,602	160,412	4.1

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

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[2] Size is measured in terms of estimated person-years worked.

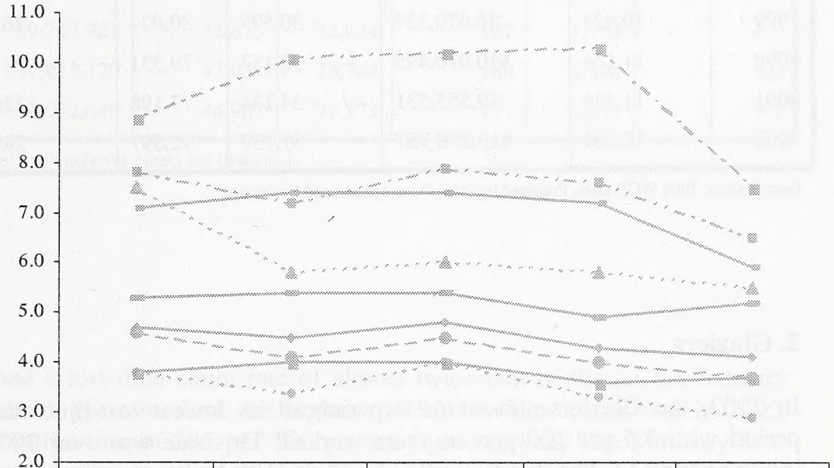
[3] The lost-time claim rate can only be considered reliable for employers with 40 or more person-years. It is recommended that the lost-time claim rate not be calculated based upon fewer than 40 person-years.

2.2 Lost-Time Claim Rate by ACSA Industries

Chart 2.2 displays a comprehensive view of the lost-time claim rate for all ACSA industries between 1998 and 2002. Masonry had the highest lost-time claim rate throughout this period, while the Roadbuilders sub-sector had the lowest.

Chart 2.2

Lost-Time Claim Rate
ACSA Sub-Sectors
Alberta: 1998 - 2002



	1998	1999	2000	2001	2002
Drywall and Residential Construction	5.3	5.4	5.4	4.9	5.2
Glaziers	7.5	5.8	6.0	5.8	5.5
Industrial Construction	4.6	4.1	4.5	4.0	3.7
Masonry	8.9	10.1	10.2	10.3	7.5
Mechanical Electrical Insulation	3.8	4.0	4.0	3.6	3.7
Roadbuilders	3.8	3.4	4.0	3.3	2.9
Roofers	7.8	7.2	7.9	7.6	6.5
Lime, Cement and Concrete Products Manufacturing	7.1	7.4	7.4	7.2	5.9
All ACSA Industries	4.7	4.5	4.8	4.3	4.1

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

1. Drywall and Residential Construction

The Drywall and Residential Construction sub-sector had a 2002 lost-time claim rate of 5.2 per 100 person-years worked, which was higher than the ACSA industry average. The lost-time claim rate of 5.2 per 100 person-years worked was an increase of six percent from 2001 (see Table 2.2A).

Table 2.2A Drywall and Residential Construction

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	10,236	$8,560,311	31,631	77,120	244	1,681	5.3
1999	10,823	$6,670,337	30,597	80,024	262	1,649	5.4
2000	11,154	$10,070,495	32,153	79,331	247	1,730	5.4
2001	11,754	$9,555,531	34,124	77,198	226	1,673	4.9
2002	12,264	$13,290,957	37,137	92,597	249	1,931	5.2

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

2. Glaziers

In 2002, the Glaziers sub-sector experienced its lowest lost-time claim rate in the five-year period with 5.5 per 100 person-years worked. This rate was over 30% higher than the ACSA industry average. The duration rate of 133 per 100 person-years worked was the lowest between 1998 and 2002 (see Table 2.2B).

Table 2.2B Glaziers

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	483	$1,737,271	5,565	10,277	185	416	7.5
1999	498	$675,441	6,278	8,629	137	367	5.8
2000	518	$1,330,482	6,026	10,766	179	360	6.0
2001	528	$1,239,053	6,358	9,837	155	370	5.8
2002	547	$1,451,562	6,666	8,857	133	366	5.5

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

3. Industrial Construction

The Industrial Construction sub-sector had a lost-time claim rate of 3.7 per 100 person-years worked, which was almost 10% lower the ACSA industry average. The lost-time claim rate of 3.7 was the lowest rate in the last five years (see Table 2.2C).

Table 2.2C **Industrial Construction**

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	5,568	$7,242,220	30,963	53,953	174	1,426	4.6
1999	5,729	$4,692,451	36,111	56,872	157	1,488	4.1
2000	6,165	$9,767,924	38,875	72,654	187	1,763	4.5
2001	6,809	$11,912,720	42,051	75,744	180	1,698	4.0
2002	7,271	$13,052,049	44,967	79,773	177	1,672	3.7

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

4. Masonry

The Masonry sub-sector had a lost-time claim rate of almost twice that of the ACSA industry average, at 7.5 per 100 person-years worked, the highest ACSA lost-time claim rate in 2002. Masonry experienced a duration rate of 295 per 100 person-years worked. The Masonry lost-time claim rate and the duration rate were the lowest, in the last five years (see Table 2.2D).

Table 2.2D **Masonry**

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	198	$311,205	761	2,622	345	68	8.9
1999	212	$315,885	868	3,782	436	88	10.1
2000	212	$400,911	843	3,303	392	86	10.2
2001	228	$429,039	986	3,223	327	102	10.3
2002	241	$767,465	1,098	3,242	295	82	7.5

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

5. Mechanical Electrical Insulation

Mechanical Electrical Insulation experienced an increase in lost-time claim rate from 3.6 to 3.7 per 100 person-years worked in 2001 to 2002, respectively. The duration rate was 135 per 100 person-years worked in 2002 (see Table 2.2E).

Table 2.2E Mechanical Electrical Insulation

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	3,651	$3,674,928	24,133	24,003	99	917	3.8
1999	3,857	$2,904,048	25,087	30,222	120	1,011	4.0
2000	4,077	$4,546,647	26,238	30,868	118	1,039	4.0
2001	4,181	$4,933,927	28,367	30,414	107	1,030	3.6
2002	4,385	$6,888,324	30,732	41,494	135	1,135	3.7

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

6. Roadbuilders

The Roadbuilders sub-sector experienced the lowest ACSA lost-time claim rate of 2.9 per 100 person-years worked, in 2002. The duration rate in 2002 was the lowest in the last five years, at 153 per 100 person-years worked (see Table 2.2F).

Table 2.2F Roadbuilders

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	5,476	$8,069,202	29,210	57,613	197	1,114	3.8
1999	5,687	$4,710,934	27,683	51,063	184	939	3.4
2000	5,944	$10,637,314	28,011	57,724	206	1,122	4.0
2001	6,280	$8,080,493	29,598	52,535	177	980	3.3
2002	6,507	$8,636,445	31,716	48,620	153	910	2.9

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

7. Roofers

In 2002, Roofers had a lost-time claim rate that was almost 60% higher than the ACSA lost-time claim rate, at 6.5 per 100 person-years worked. From 2001 to 2002 the lost-time claim rate experienced a decrease, which was the lowest lost-time claim rate in the last five years for the Roofers sub-sector. The duration rate of 333 per 100 person-years worked was the lowest rate between 1998 and 2002 (see Table 2.2G).

Table 2.2G Roofers

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	906	$2,071,007	3,602	14,074	391	281	7.8
1999	959	$1,731,133	3,889	17,314	445	281	7.2
2000	958	$2,504,039	3,492	15,614	447	277	7.9
2001	966	$1,885,306	4,077	14,554	357	310	7.6
2002	1,005	$2,559,785	4,543	15,117	333	295	6.5

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

8. Lime, Cement and Concrete Products Manufacturing

The Lime, Cement and Concrete Products Manufacturing sub-sector had a 2002 lost-time claim rate of 5.9 per 100 person-years worked, which was higher than the ACSA industry average. The lost-time claim rate of 5.9 per 100 person-years was the lowest rate in the last five years (see Table 2.2H).

Table 2.2H Lime, Cement and Concrete Products Manufacturing

Year	Number of Accounts	Cost of Claims	Estimated Person - Years	Days Lost	Duration Rate	Lost-Time Claims	Lost-Time Claim Rate
1998	761	$1,210,521	2,934	10,141	346	209	7.1
1999	843	$984,598	2,837	9,258	326	211	7.4
2000	872	$1,131,606	2,888	9,326	323	214	7.4
2001	895	$1,265,795	2,963	9,249	312	212	7.2
2002	1,076	$1,650,797	3,553	11,689	329	211	5.9

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

3. Analysis of the Lost-Time Claims

In this section, specific details of the occupational injuries and diseases will be examined by nature of injury, part of body injured, source of injury, type of event and duration of disability. Tables are provided to enable comparisons of 2002 injuries and diseases in ACSA industries with provincial averages and trends. A detailed explanation of the formulas for calculating the indicators of the comparison tables is available in Appendix A.

3.1 Nature of Injury

The nature of injury is used to identify the physical characteristics of the injury or disease. Between 1998 and 2002, 90% of all the lost-time claims were traumatic injuries and disorders. The four most common specific traumatic injuries and diseases were: sprains, strains and tears, 43%; fractures and dislocations, 14%; open wounds, 12% and surface wounds and bruises, 11% (see Table 3.1A).

Table 3.1A **Nature of Injury or Disease**

Lost-Time Claims **Alberta: 1998 to 2002**	**Occurrence Year**					**Total**	
	1998	**1999**	**2000**	**2001**	**2002**	**Number of Claims**	**% of Total Number of Claims**
Traumatic Injuries and Disorders	**5,605**	**5,462**	**5,936**	**5,644**	**5,808**	**28,455**	**89.7%**
Sprains, Strains and Tears	2,581	2,563	2,817	2,743	2,846	13,550	42.7%
Fractures and Dislocations	932	821	886	872	852	4,363	13.8%
Open Wounds	788	708	762	680	749	3,687	11.6%
Surface Wounds and Bruises	711	711	731	666	607	3,426	10.8%
Other Traumatic Injuries and Disorders	461	549	617	571	652	2,850	9.0%
Burns	132	110	123	112	102	579	1.8%
Systemic Diseases and Disorders	**325**	**315**	**403**	**402**	**403**	**1,848**	**5.8%**
Multiple Diseases, Conditions and Disorders	**25**	**17**	**5**	**4**	**5**	**56**	**0.2%**
Symptoms, Signs and Ill-Defined Conditions	**10**	**13**	**2**	**14**	**15**	**54**	**0.2%**
Other Diseases, Conditions and Disorders	**1**	**5**	**7**	**4**	**10**	**27**	**0.1%**
Tumors, Neoplasms and Cancer	**6**	**2**	**3**	**3**	**2**	**16**	**0.1%**
Infectious and Parasitic Diseases	**1**	**2**	**1**	**1**	**2**	**7**	**<0.1%**
Nature – Unknown	**139**	**218**	**234**	**303**	**357**	**1,251**	**3.9%**
Total	**6,112**	**6,034**	**6,591**	**6,375**	**6,602**	**31,714**	**100.0%**

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

In 2002, sprains, strains and tears accounted for 43% of the total ACSA industries claims and were 1.2 times higher than the provincial average. Multiple diseases, conditions and disorders were more than twice as high as the provincial average, at 2.8 (see Table 3.1B).

Table 3.1B Nature of Injury or Disease – Comparison 2002

Nature of Injury or Disease	Percent of Total Industries' Claims	Number of Times Higher/Lower than the Provincial Average[4]
Multiple Diseases, Conditions and Disorders	0.1%	2.8
Fractures and Dislocations	12.9%	2.0
Open Wounds	11.3%	1.7
Tumors, Neoplasms and Cancer	<0.1%	1.6
Systemic Diseases and Disorders	6.1%	1.5
Other Traumatic Injuries and Disorders	9.9%	1.4
Nature of Injury – Unknown	5.4%	1.4
Sprains, Strains and Tears	43.1%	1.2
Surface Wounds and Bruises	9.2%	1.2
Burns	1.5%	0.9
Symptoms, Signs and Ill-Defined Conditions	0.2%	0.9
Other Diseases, Conditions and Disorders	0.2%	0.7
Infectious and Parasitic Diseases	<0.1%	0.7

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

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[4] 1 indicates that the injury of the industries is equal to the provincial average; greater than 1 indicates that the injury of the industries is higher than the provincial average; less than 1 indicates that the injury of the industries is lower than the provincial average.

3.2 Part of Body Injured

Between 1998 and 2002, the trunk was the main body part injured, accounting for over one-third of the total lost-time claims in the ACSA industries, followed by upper extremities, at 25% and lower extremities at 22%.

The most common part of the trunk injured was the back, including spine and spinal cord, representing almost one-quarter of the total lost-time claims (see Table 3.2A).

Table 3.2 **Part of Body Injured**

Lost-Time Claims Alberta: 1998 to 2002	**Occurrence Year**					**Total**	
	1998	**1999**	**2000**	**2001**	**2002**	**Number of Claims**	**% of Total Number of Claims**
Trunk	**2,322**	**2,350**	**2,503**	**2,338**	**2,367**	**11,880**	**37.4%**
Back, including Spine, Spinal Cord	1,580	1,557	1,644	1,499	1,494	7,774	24.5%
Other Trunk	742	793	859	839	873	4,106	12.9%
Upper Extremities	**1,568**	**1,548**	**1,655**	**1,596**	**1,619**	**7,986**	**25. 1%**
Hand(s)	582	612	651	627	643	3,115	9.8%
Finger(s)	618	567	582	542	561	2,870	9.0%
Other Upper Extremities	368	369	422	427	415	2,001	6.3%
Lower Extremities	**1,395**	**1,310**	**1,450**	**1,414**	**1,466**	**7,035**	**22.2%**
Leg(s)	672	616	664	672	730	3,354	10.6%
Ankle(s) and Foot (Feet) – Not Toes	651	623	693	666	653	3,286	10.4%
Other Lower Extremities	72	71	93	76	83	395	1.2%
Head	**441**	**366**	**436**	**456**	**432**	**2,131**	**6.7%**
Other Head	206	182	221	248	245	1,102	3.5%
Eye(s) – Optic Nerve, Vision	235	184	215	208	187	1,029	3.2%
Multiple Body Parts	**193**	**285**	**342**	**370**	**535**	**1,725**	**5.4%**
Neck	**154**	**137**	**172**	**157**	**132**	**752**	**2.4%**
Body Systems	**32**	**26**	**21**	**19**	**26**	**124**	**0.4%**
Part of Body – Unknown	**7**	**11**	**10**	**23**	**24**	**75**	**0.2%**
Other Body Part(s)	**-**	**1**	**2**	**2**	**1**	**6**	**<0.1%**
Total	**6,112**	**6,034**	**6,591**	**6,375**	**6,602**	**31,714**	**100.0%**

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

Leg(s) accounted for 11% of the total lost-time claims in the ACSA industries and was 1.7 times higher than the provincial average. In 2002, all parts of the body injured in the ASCA industries were higher than the provincial average, except other body part(s), which was 0.4 times lower than the provincial average (see Table 3.2B).

Table 3.2B Part of Body Injured – Comparison 2002

Part of Body Injured	Percent of Total Industries' Claims	Number of Times Higher/Lower than the Provincial Average[5]
Leg(s)	11.1%	1.7
Ankle(s) and Foot (Feet) Not Toes	9.9%	1.6
Eye(s) – Optic Nerve, Vision	2.8%	1.6
Other Trunk	13.2%	1.5
Hand(s)	9.7%	1.4
Finger(s)	8.5%	1.4
Multiple Body Parts	8.1%	1.3
Part of Body – Unknown	0.4%	1.3
Back, including Spine, Spinal Cord	22.6%	1.2
Other Upper Extremities	6.3%	1.2
Other Head	3.7%	1.2
Neck	2.0%	1.2
Other Lower Extremities	1.3%	1.2
Body Systems	0.4%	1.0
Other Body Part(s)	< 0.1%	0.4

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

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[5] 1 indicates that the injury of the industries is equal to the provincial average; greater than 1 indicates that the injury of the industries is higher than the provincial average; less than 1 indicates that the injury of the industries is lower than the provincial average.

3.3 Source of Injury

The source of injury or disease is used to describe the object or substance with which the worker came into contact resulting in an injury or disease.

The two primary sources of injury for the lost-time claims in the ACSA industries between 1998 and 2002 were structures and surfaces, 19% and parts and materials, 18% (see Table 3.3A).

Table 3.3A **Source of Injury or Disease**

Lost-Time Claims Alberta: 1998 to 2002	**Occurrence Year**					**Total**	
	1998	**1999**	**2000**	**2001**	**2002**	**Number of Claims**	**% of Total Number of Claims**
Structures and Surfaces	**1,133**	**1,078**	**1,289**	**1,185**	**1,365**	**6,050**	**19.1%**
Parts and Materials	**1,230**	**1,148**	**1,230**	**1,129**	**1,049**	**5,786**	**18.2%**
Persons, Plants, Animals and Minerals	**874**	**890**	**1,019**	**967**	**1,102**	**4,852**	**15.3%**
Person – Injured or Ill Worker	692	775	852	840	1,010	4,169	13.1%
Person – Other than Injured or Ill Worker	14	5	20	4	4	47	0.1%
Minerals – Metallic and Nonmetallic	65	57	84	74	49	329	1.0%
Other Persons, Plants, Animals and Minerals	103	53	63	49	39	307	1.0%
Tools, Instruments and Equipment	**531**	**515**	**550**	**495**	**506**	**2,597**	**8.2%**
Hand Tools - Non-Powered	258	279	274	248	241	1,300	4.1%
Hand Tools – Powered	131	94	129	115	131	600	1.9%
Other Tools and Equipment	142	142	147	132	134	697	2.2%
Containers	**292**	**320**	**371**	**378**	**307**	**1,668**	**5.3%**
Machinery	**341**	**312**	**354**	**304**	**318**	**1,629**	**5.1%**
Vehicles	**309**	**301**	**331**	**331**	**340**	**1,612**	**5.1%**
Other Sources	**222**	**206**	**282**	**265**	**247**	**1,222**	**3.9%**
Furniture and Fixtures	**83**	**86**	**103**	**86**	**107**	**465**	**1.5%**
Chemicals and Chemical Products	**62**	**41**	**50**	**45**	**46**	**244**	**0.8%**
Source – Unknown	**1,035**	**1,137**	**1,012**	**1,190**	**1,215**	**5,589**	**17.6%**
Total	**6,112**	**6,034**	**6,591**	**6,375**	**6,602**	**31,714**	**100.0%**

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

Those that were equal to or lower than the provincial average in 2002 were: vehicles, 1.0; containers, 0.7; furniture and fixtures, 0.7, other persons, plants, animals and minerals, 0.5 and person – other than injured or ill worker, <0.1 (see Table 3.3B).

Table 3.3B Source of Injury or Disease – Comparison 2002

Source of Injury or Disease	Percent of Total Industries' Claims	Number of Times Higher/Lower than the Provincial Average[6]
Minerals – Metallic and Nonmetallic	0.7%	3.1
Hand Tools – Powered	2.0%	2.9
Parts and Materials	15.9%	2.4
Structures and Surfaces	20.7%	1.9
Hand Tools – Non-Powered	3.7%	1.5
Other Tools and Equipments	2.0%	1.5
Source – Unknown	18.4%	1.4
Other Sources	3.7%	1.4
Person – Injured or Ill Worker	15.3%	1.3
Machinery	4.8%	1.2
Chemicals and Chemical Products	0.7%	1.1
Vehicles	5.1%	1.0
Containers	4.7%	0.7
Furniture and Fixtures	1.6%	0.7
Other Persons, Plants, Animals and Minerals	0.6%	0.5
Person – Other Than Injured or Ill Worker	0.1%	<0.1

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

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[6] 1 indicates that the injury of the industries is equal to the provincial average; greater than 1 indicates that the injury of the industries is higher than the provincial average; less than 1 indicates that the injury of the industries is lower than the provincial average.

3.4 Type of Event or Exposure

The type of event or exposure is used to describe the incident or event that occurred at the time of the exposure that directly resulted in the injury or disease.

The two most common types of event or exposure, comprising almost two-thirds of the total lost-time claims in all ACSA industries in the last five years, are bodily reaction and exertion, 34% and contact with objects and equipment, 28% (see Table 3.4A).

Table 3.4A **Type of Event or Exposure**

Lost-Time Claims Alberta: 1998 to 2002	Occurrence Year					Total	
	1998	1999	2000	2001	2002	Number of Claims	% of Total Number of Claims
Bodily Reaction and Exertion	**1,987**	**2,087**	**2,317**	**2,190**	**2,283**	**10,864**	**34.3%**
Overexertion	1,285	1,295	1,445	1,331	1,249	6,605	20.8%
Bodily Reaction	603	620	644	641	753	3,261	10.3%
Repetitive Motions	71	122	169	150	190	702	2.2%
Other Bodily Reaction and Exertion	28	50	59	68	91	296	0.9%
Contact with Objects and Equipment	**1,848**	**1,716**	**1,884**	**1,722**	**1,668**	**8,838**	**27.9%**
Struck by Objects	1,033	964	1,028	934	930	4,889	15.4%
Struck Against Objects	352	362	380	361	340	1,795	5.7%
Caught in Objects	290	288	320	281	287	1,466	4.6%
Rubbed or Abraded	135	90	137	121	79	562	1.8%
Other Contact with Objects and Equipment	38	12	19	25	32	126	0.4%
Falls	**1,286**	**1,222**	**1,345**	**1,365**	**1,376**	**6,594**	**20.8%**
Fall to Lower Level	789	697	741	730	748	3,705	11.7%
Fall on Same Level	371	374	478	506	535	2,264	7.1%
Other Falls	126	151	126	129	93	625	2.0%
Transportation Accidents	**230**	**227**	**266**	**264**	**280**	**1,267**	**4.0%**
Exposure to Harmful Substances	**233**	**182**	**196**	**191**	**206**	**1,008**	**3.2%**
Fires and Explosions	**18**	**18**	**13**	**21**	**9**	**79**	**0.2%**
Assaults and Violent Acts	**10**	**3**	**17**	**7**	**5**	**42**	**0.1%**
Assaults and Violent Acts by Person(s)	9	3	14	3	3	32	0.1%
Other Assaults and Violent Acts	1	-	3	4	2	10	< 0.1%
Other Events or Exposures	**1**	**-**	**-**	**-**	**-**	**1**	**< 0.1%**
Type of Event – Unknown	**499**	**579**	**553**	**615**	**775**	**3,021**	**9.5%**
Total	**6,112**	**6,034**	**6,591**	**6,375**	**6,602**	**31,714**	**100.0%**

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

The following types of event or exposure were equal to or lower than the provincial average in 2002: repetitive motions, 1.0; assaults and violent acts by person(s), 0.1 and other violent assaults and violent acts, 0.2 (see Table 3.4B).

Table 3.4B Type of Event or Exposure – Comparison 2002

Type of Event	Percent of Total Industries' Claims	Number of Times Higher/Lower than the Provincial Average[7]
Fall to Lower Level	11.3%	3.0
Rubbed or Abraded	1.2%	1.8
Other Contact with Objects and Equipment	0.5%	1.8
Other Falls	1.4%	1.7
Struck by Objects	14.1%	1.6
Fires and Explosions	0.1%	1.6
Type of Event – Unknown	11.7%	1.4
Bodily Reaction	11.4%	1.4
Struck Against Objects	5.1%	1.4
Other Bodily Reaction and Exertion	1.4%	1.4
Caught in Objects	4.3%	1.3
Fall on Same Level	8.1%	1.2
Transportation Accidents	4.2%	1.2
Exposure to Harmful Substances	3.1%	1.2
Overexertion	18.9%	1.1
Repetitive Motions	2.9%	1.0
Other Violent Assaults and Violent Acts	< 0.1%	0.2
Assaults and Violent Acts by Person(s)	< 0.1%	0.1

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

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[7] 1 indicates that the injury of the industries is equal to the provincial average; greater than 1 indicates that the injury of the industries is higher than the provincial average; less than 1 indicates that the injury of the industries is lower than the provincial average.

3.5 Duration of Disability

Duration of disability[8] is intended to reflect the severity of the effects of occupational injury and disease as reflected by the number of days off work. However, the efforts of employers to introduce modified work programs to integrate injured workers more quickly back into the workforce can have a major impact on workdays lost.

Almost one-third of claims resulted in a duration of disability of 10 days or less, at 1-5 days, 28% and 6-10 days, 13%. More than one-quarter of the lost-time claims between 1998 and 2002 resulted in 51 days or more lost from work (see Table 3.5A).

Table 3.5A **Duration of Disability**

Lost-Time Claims	Occurrence Year					Total	
Alberta: 1998 to 2002	1998	1999	2000	2001	2002	Number of Claims	% of Total Number of Claims
1 – 5 Days	1,795	1,681	1,887	1,753	1,718	8,834	27.9%
6 – 10 Days	802	788	861	819	852	4,122	13.0%
11 – 15 Days	470	463	478	450	421	2,282	7.2%
16 – 20 Days	329	317	301	308	294	1,549	4.9%
21 – 30 Days	462	444	440	452	413	2,211	7.0%
31 – 40 Days	332	350	372	338	343	1,735	5.5%
41 – 50 Days	258	252	285	273	310	1,378	4.3%
51 Days or More	1,522	1,573	1,690	1,687	1,915	8,387	26.4%
Unspecified	142	166	277	295	336	1,216	3.8%
Total	6,112	6,034	6,591	6,375	6,602	31,714	100.0%

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

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[8] The duration of disability refers to the length of time, in days, for which the worker receives wage compensation from the WCB.

In 2002, 51 days of duration was more than double the provincial average, at 2.1. All durations of disability for the ACSA industries were higher than the provincial average (see Table 3.5B).

Table 3.5B Duration of Disability – Comparison 2002

Duration of Disability	Percent of Total Industries Claims	Number of Times Higher/Lower than the Provincial Average[9]
1 – 5 Days	26.0%	1.0
6 – 10 Days	12.9%	1.3
11 – 15 Days	6.4%	1.2
16 – 20 Days	4.5%	1.3
21 – 30 Days	6.3%	1.4
31 – 40 Days	5.2%	1.6
41 – 50 Days	4.7%	1.8
51 Days or More	29.0%	2.1
Unspecified	5.1%	1.3

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

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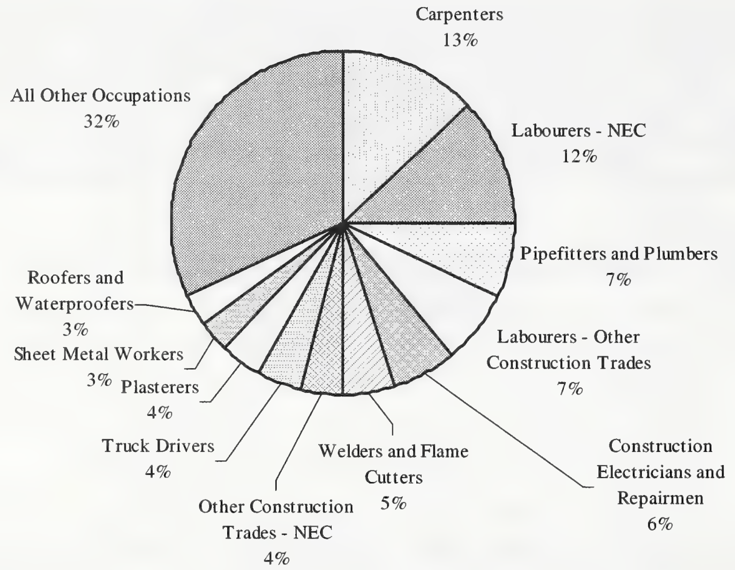
[9] 1 indicates that the injury of the industries is equal to the provincial average; greater than 1 indicates that the injury of the industries is higher than the provincial average; less than 1 indicates that the injury of the industries is lower than the provincial average.

4. Characteristics of the Injured Worker

Between 1998 and 2002, Carpenters accounted for more than one-tenth of the total lost-time claims, followed by Labourers, at 12% (see Chart 4.0).

Chart 4.0 **Lost-Time Claim by Occupation in All ACSA Industries Alberta: 1998-2002**



Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

Table 4.0 indicates that older workers have fewer injuries. Between 1998 and 2002, almost one-quarter of the claims were from workers aged 15 to 24 years. Those aged 25 to 34 years had the highest representation for all ACSA industries at 29%, followed by those aged 35 to 44 years, at 27%. Less than one-quarter of the claims were from workers aged 45 years and over.

Table 4.0 **Age of Injured Worker**

Lost-Time Claims Alberta: 1998 to 2002	Occurrence Year					Total	
	1998	1999	2000	2001	2002	Number of Claims	% of Total Number of Claims
15 – 19 Years	371	318	366	344	374	1,773	5.6%
20 – 24 Years	1,024	983	1,029	1,009	1,071	5,116	16.1%
25 – 34 Years	1,892	1,882	1,830	1,770	1,808	9,182	29.0%
35 – 44 Years	1,687	1,617	1,897	1,708	1,752	8,661	27.3%
45 –54 Years	804	797	990	1,062	1,095	4,748	15.0%
55 – 64 Years	300	383	419	410	438	1,950	6.1%
65 Years and Over	26	45	48	59	56	234	0.7%
Age Unspecified	8	9	12	13	8	50	0.2%
Total	6,112	6,034	6,591	6,375	6,602	31,714	100.0%

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

In the ACSA industries, five percent of total claims in the last five years were from females (see Table 4.1).

Table 4.1 **Gender of Injured Worker**

Lost-Time Claims Alberta: 1998 to 2002	Occurrence Year					Total	
	1998	1999	2000	2001	2002	Number of Claims	% of Total Number of Claims
Male	5,784	5,669	6,149	5,895	6,087	29,584	93.3%
Female	228	245	318	321	332	1,444	4.6%
Gender - Unspecified	100	120	124	159	183	686	2.2%
Total	6,112	6,034	6,591	6,375	6,602	31,714	100.0%

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

5. Number of Employers With a Valid Certificate of Recognition in 2002

The Workplace Health and Safety Partnerships Program promotes the development of effective health and safety management through partnerships with safety associations, industry groups, education institutes and labour organizations. A Certificate of Recognition (COR) is given to employers who develop health and safety programs that meet established standards.

In 2002, six percent of the ACSA industries' employers were COR holders. The Roadbuilders sub-sector had the most ACSA employers with valid CORs, at 14%. Employers in the Drywall and Residential Construction and Masonry sub-sectors had the fewest valid COR holders in 2002, at 1.3% and 1.2%, respectively.

Table 5.0 Number of Employers With a Valid Certificate of Recognition: 2002

	Certified Employers	Total Number of Employers	Percentage Certified
All ACSA Industries	**1,870**	**33,296**	**5.6%**
Sub-Sector			
Drywall and Residential Construction	165	12,264	1.3%
Glaziers	24	547	4.4%
Industrial Construction	420	7,271	5.8%
Masonry	3	241	1.2%
Mechanical/Electrical/Insulation	274	4,385	6.2%
Roadbuilders	896	6,507	13.8%
Roofers	51	1,005	5.1%
Lime, Cement and Concrete Products Manufacturing	37	1,076	3.4%

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

6. Occupational Fatalities

An occupational fatality is the death of a worker that results from a work-related event or exposure. AHRE classifies occupational fatalities into three general types: motor vehicle incidents, workplace incidents and occupational disease. Each is described in detail below.

Motor Vehicle Incidents

Motor vehicle incidents typically involved non-industrial vehicles operating on public roads in which the fatally injured worker was either the driver or a passenger. This type of occupational fatality also includes cases involving aircraft crashes, train crashes, helicopter crashes and water vehicle crashes. In 2002, almost one-quarter of the ACSA industries' fatalities accepted by WCB were motor vehicle incidents, at 24% (see Table 6.0).

Workplace Incidents

Workplace incidents consisted of cases in which the worker died at a worksite or as a result of injuries sustained at a worksite. This is the type of fatality that AHRE typically investigates. In 2002, 36% of the ACSA industries' fatalities accepted by WCB were workplace incidents (see Table 6.0).

Occupational Disease

Occupational disease fatalities consist mostly of recognized occupational disease, that is, disease known to be primary or exclusively work-related (e.g. asbestosis and black lung disease). This category also includes heart attacks suffered on the job. Occupational diseases are frequently diagnosed several years after the initial or crucial exposure to the toxic substance and in such cases, it is difficult to determine when the fatal exposure occurred. *The occupational disease category, therefore, should not be interpreted to reflect present worksite hazardous conditions or exposures.*

Each year the WCB accepts some occupational fatality claims for compensation. Occupational fatality claims that were accepted in a particular year may include fatalities from prior years. In 2002, almost half of all fatalities in the ACSA industries were occupational disease fatalities, at 40% (see Table 6.0).

Fatality Rate is estimated by dividing the number of accepted fatalities in the year by the number of estimated person-years worked in that year. The result is expressed as 'per 10,000 person-years worked.'

In 2002, the WCB accepted 25 fatalities for compensation in the ACSA industries. This was a decrease from 2001 (see Table 6.0). The 25 fatalities accounted for 25% of all 101 fatalities accepted by WCB in 2002.

The fatality rate was 1.6 per 10,000 person-years worked, a decrease of 27% from 2001 (see Chart 6.0).

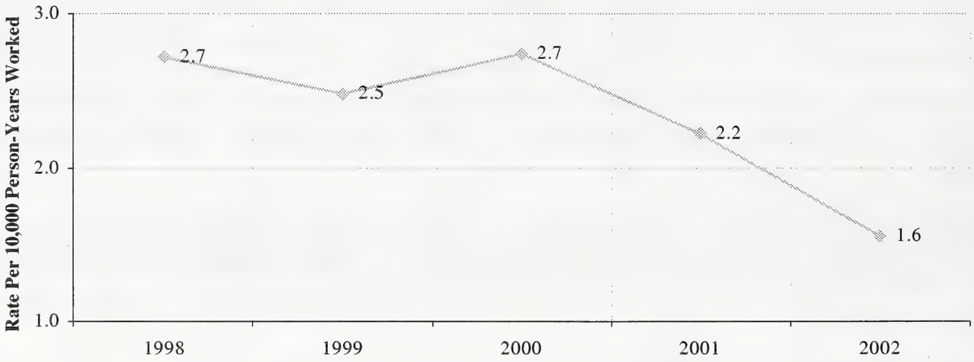
Table 6.0 Description of Construction Workplace Fatalities Accepted by the Workers' Compensation Board - Alberta Alberta: 1998-2002

Year	Occupational Diseases		Motor Vehicle Incidents		Workplace Incidents		Total	
	Number of Fatalities	%	Number of Fatalities	%	Number of Fatalities	%	Number of Fatalities	%
1998	16	45.7%	5	14.3%	14	40.0%	35	100.0%
1999	21	63.6%	3	9.1%	9	27.3%	33	100.0%
2000	16	42.1%	3	7.9%	19	50.0%	38	100.0%
2001	16	48.5%	6	18.2%	11	33.3%	33	100.0%
2002	10	40.0%	6	24.0%	9	36.0%	25	100.0%
Total	79	48.2%	23	14.0%	62	37.8%	164	100.0%

Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

Chart 6.0

Fatality Rate in All ACSA Industries Alberta 1998 - 2002



Data Source: 2002 WCB Data, Prepared by Data Development and Evaluation

7. Description of Workplace Fatalities Investigated by Occupational Health and Safety: 1998-2002

1. Drywall and Residential Construction

YEAR: 1998 FILE: 0908
OCCUPATION: Journeyman Roofing Supervisor AGE: 62
INDUSTRY: Residential Construction and Renovations
EXPERIENCE: 29 years

DESCRIPTION: Two roofers were installing asphalt shingles on the roof of a four-storey building. The workers were wearing their safety belts and lines during the installation of the shingles. They had completed a section of the roof and had used up their open bundles of shingles. The workers decided to take a break before changing over to the new location that needed to be shingled.

One of the workers went back up on the roof and decided to install a left over piece of ice dam material at the new location on the eaves of the building, not using the available fall protection equipment. The worker fell approximately 12 metres to the ground below and landed on stacked bundles of roofing shingles, which resulted in death.

YEAR: 1999 FILE: 0936
OCCUPATION: Landscape Gardener AGE: 52
INDUSTRY: Landscaping
EXPERIENCE: 75 Hours

DESCRIPTION: The landscape contractor was hired to remove two trees. The landscape gardener stated assistance would be needed to remove the trees but would start the preliminary work before a co-worker arrived. The top portion of one tree was broken and had fallen onto another tree. The landscape gardener needed to cut some branches in order to remove the broken piece in the adjacent tree. While the landscape gardener was cutting branches with a chainsaw, the anchor point holding the lifeline failed and the worker fell 7.6 metres to the ground.

YEAR: 2000 FILE: 0964
OCCUPATION: Painter AGE: 60
INDUSTRY: Painting and Decorating
EXPERIENCE: 30 years

DESCRIPTION: One worker was standing on a 2.54 metre level scaffold platform, spray-painting the ceiling of a store. As a section was completed, the helper would move the rolling scaffold with the worker sitting on it. The helper had been adding paint to the sprayer container and looked up to see the worker throwing the spray gun and trying to regain balance. The worker fell forward off the scaffold and landed on the concrete floor.

YEAR: 2000 FILE: 0967
OCCUPATION: Labourer AGE: 14
INDUSTRY: Residential General Contracting/Construction/Renovations
EXPERIENCE: 1 day

DESCRIPTION: The worker had been sent to the roof of a condominium construction site to vacuum up rain water. As the worker was pushing the dolly/vacuum over a ramp adjacent to a skylight opening, the worker fell through the skylight opening and landed on the concrete floor 16 metres below. After being transported to hospital, the worker was pronounced dead on arrival.

Note: There were five fatalities (three fatalities in 2001 and two fatalities in 2002) that are still under investigation.

2. Glaziers

There were no investigated workplace fatalities in this sub-sector for the period 1998 through 2002.

3. Industrial Construction

YEAR: 1998 FILE: 0892
OCCUPATION: Swamper AGE: 49
INDUSTRY: Industrial Construction
EXPERIENCE: 31 years

DESCRIPTION: The site was the extension of an existing parkade. The external cement shell for one of the stairwells for the project was erected and a second stairwell was in the process of being erected. During the erection of the first stairwell, two temporary work platforms had been installed inside the structure. Workers began the process of installing the cement stairs and landings within the stairwell. They worked in a progressive manner from the base of the structure up. They would install the cement formworks for two sets of stairs and two landings. This was followed by the installation of reinforcing bar and the pouring of the cement. Once the cement had cured they stripped out the formworks, installed temporary guardrails and began to assemble the formworks for the next sets of stairs and landings. This continued until the formworks approached the lower of the two temporary work platforms still present in the stairwell. Three workers were given the task of dismantling the platform. The workers accessed the platform from the newly created landing and from the formworks in place for the next set of stairs and landing. There was no provision for fall protection at that level; they were working in an area where the temporary guardrails had not yet been installed. They removed the decking, support beams and most of the cement anchor bolts supporting the platform. Two of the three workers went down the stairs to exit the structure. The third worker was removing the formworks for a set of stairs. The worker slipped and fell through the vertical void between the landings and stairs to the cement at the base of the structure, a total of 9.1 metres.

YEAR: 1998 FILE: 0896
OCCUPATION: Labourer AGE: 39
INDUSTRY: Industrial Labour Manpower Services
EXPERIENCE: Four days, although previously at work site

DESCRIPTION: Two labourers were assisting the operator of a crane to unload a 5.67 tonne heat exchanger vessel from a hi-boy trailer and to move it to an area where it could be sandblasted and then painted. They attached slings to the vessel. After the crane operator lowered the vessel from the trailer and was positioning the load for the carry, the labourers moved to opposite ends of the vessel. The operator backed up the crane for about eight metres while the two labourers steadied the vessel by holding on to the ends. As the operator began a 90-degree turn, the crane tipped on its right side. The top of the boom struck a labourer, causing fatal injuries, while the worker may have been trying to avoid being struck by the vessel.

YEAR: 1998 FILE: 0906
OCCUPATION: Ironworker AGE: 36
INDUSTRY: Erection/Removal of Prefabricated Steel Structures
EXPERIENCE: 20 years

OCCUPATION: Ironworker AGE: 28
INDUSTRY: Erection/ Removal of Prefabricated Steel Structures
EXPERIENCE: 4 years

DESCRIPTION: A pre-engineered industrial building was being erected. Three ironworkers proceeded to move a 10-metre high rolling scaffold from one exterior corner of the structure to another exterior corner. Positioned around the scaffold, they moved the scaffold about 17 metres when it contacted 13,000 volt three phase overhead power lines. Two of the workers were electrocuted and a third was seriously injured.

YEAR: 1998 FILE: 0911
OCCUPATION: Journeyman Electrician AGE: 47
INDUSTRY: Industrial Plant Maintenance
EXPERIENCE: 15 years

DESCRIPTION: A shift foreman and an electrician were repairing some electrical problems in a large sulphur plant. They had set up a ladder in order to reach a ceiling light fixture. After securing the ladder, the electrician climbed up, lowered the fixture and was using an electrical tester to test for electrical current. Unknown to the electrician, a broken electrical wire inside the light energized the fixture causing it to arc on the ladder. The electrician fell 11.5 metres to the railway track scale below and was fatally injured. The shift foreman who was holding the ladder was not injured.

YEAR: 1999 FILE: 0927
OCCUPATION: Labourer AGE: 38
INDUSTRY: Welding
EXPERIENCE: 2.5 years

DESCRIPTION: The worker was sandblasting from underneath a metal storage trailer to prepare it for painting. The trailer was used for storing explosives and weighed approximately

1,340 kilograms. The clearance underneath the trailer was 0.7 metres at the rear and 0.6 metres at the front. The trailer was supported on a single axle wheel assembly at the rear and one support leg at the front right corner. The metal storage trailer tipped forward during the sandblasting operation. The worker was pinned underneath the trailer and sustained fatal injuries.

YEAR: 1999 FILE: 0946
OCCUPATION: Metal-tank Worker AGE: 44
INDUSTRY: Storage Tanks Erect and Dismantle
EXPERIENCE: 25 years

DESCRIPTION: The worker was installing a portable mechanical augering system inside a silo to remove silage (cattle feed). The worker's right arm was caught by the cutting teeth of the operating auger and was severed near the shoulder when it was placed in the silo to determine the level of silage. The worker ran into the farmyard to get assistance. About 64 metres away from the silo, the worker collapsed and died of sustained injuries.

Note: There were three fatalities (one fatality in 2000, one fatality in 2001 and one fatality in 2002) that are still under investigation.

4. Masonry

Note: There was one fatality in 2002 that is still under investigation.

5. Mechanical/Electrical/Insulation

YEAR: 1998 FILE: 0898
OCCUPATION: Electrician AGE: 23
INDUSTRY: Electric Wiring
EXPERIENCE: N/A

DESCRIPTION: An electrician was drilling holes through the wall of a small building, working alone from the inside, while standing on a stepladder. The worker was using a drill with a hole-saw bit, powered by a generator set at 110 volts. All other workers were outside the shack. The worker had completed the second of two holes and another worker witnessed the bit coming through and then being withdrawn. When the building was entered a short time later, the electrician was found unconscious on the floor, and efforts to revive the electrician failed.

YEAR: 1998 FILE: 0905
OCCUPATION: Sprinkler Fitter AGE: 40
INDUSTRY: Installation and Servicing of Fire Sprinkler System
EXPERIENCE: 20 years

DESCRIPTION: The journeyman and an apprentice had been raising two parallel sections of an existing sprinkler line by turning the threaded pipe hanger rod. Both workers were stationed on a platform secured to an overhead crane. Each of the parallel sections of sprinkler line that the workers had been raising was supported by two clevis pipe hangers and had the flange bolts removed at each end. Both workers secured their fall protection lanyard to the section of the sprinkler line they were raising. As the journeyman was turning the threaded pipe hanger rod, it inadvertently unthreaded the nut at the base of the rod. This resulted in that particular section of the sprinkler line dropping onto the platform and sliding off the crane.

The journeyman, whose lanyard was attached to the line, fell with the sprinkler line approximately 13 metres to the concrete floor, resulting in death.

YEAR: 2001 FILE: 0991
OCCUPATION: Journeyman Electrician AGE: 32
INDUSTRY: Electrical Instrumentation Contracting
EXPERIENCE: Moderate

DESCRIPTION: An apprentice electrician was instructed by the electrician to fix a problem with three light fixtures located in the men's washroom. The electrician shut off the breaker in the electrical communications room for the men's washroom so that the apprentice could commence work. The electrician climbed the ladder to gain access into the crawling space where two light fixtures had problems and went on top of the air duct to work on an electrical junction box that supplied power to two light fixtures. The power had not been shut off and the circuit had not been tested. The worker came in contact with a live electrical wire and was electrocuted.

6. Roadbuilders

YEAR: 1998 FILE: 0886
OCCUPATION: Welder AGE: 32
INDUSTRY: Mobile Equipment Operations
EXPERIENCE: 8.5 years

DESCRIPTION: A company was contracted to dismantle a bitumen pilot plant. To move a roll crusher from its concrete foundation, the contractor moved a 50-ton truck crane to the site. At the time of the lift, the crane was equipped with 37 metres of boom and was operating at a radius of eight metres. The crusher was to be lifted off the elevated concrete foundation and set to the side, to facilitate dismantling the conveyor.

Workers attached slings to the roll crusher. The crane hook was attached and the lift started. The crusher was raised slightly from its foundation and held, while the outriggers were checked to ensure that they were solidly planted on the ground. After receiving a signal from the designated signaller, the crane operator continued with the lift and slowly swung the load to the right. The boom buckled and collapsed to the crane operator's right. The signalman ran in the same direction, and was hit and pinned by the collapsed boom and died later in hospital.

YEAR: 1998 FILE: 0893
OCCUPATION: Equipment Operator AGE: 59
INDUSTRY: Pipeline Construction
EXPERIENCE: 2 years

DESCRIPTION: A heavy equipment operator was operating a Timberjack used to haul sandblasting equipment for the purpose of sandblasting 18" pipe on a pipeline. The operator stopped the Timberjack on the pipeline right-of-way alongside the pipe, exited and was walking away from the equipment when apparently the operator noticed the equipment moving. The operator tried to jump back into the Timberjack and fell between the left front chain-covered wheel and the dozer blade lifting mechanism of the machine. The operator received crushing injuries to the head and torso resulting in a fatality.

YEAR: 1998 FILE: 0894
OCCUPATION: Truck Driver AGE: 55
INDUSTRY: Mobile Equipment Operations
EXPERIENCE: N/A

DESCRIPTION: The driver was working alone in moving a large crawler type excavator to the construction site for a new compressor station. The worker was operating a tractor-trailer unit on a temporary access road without a gravel base. The road had a short section with a sharp hill having an average grade of 14%. Vehicles trying to ascend the hill could not attain any speed at the bottom due to a 45-degree curve. A new road with fewer grades had just been finished.

While attempting to traverse the steep grade, without chains or the full use of the driving wheels, the truck spun out at the crest of the hill. In trying to back down the hill, the tractor-trailer unit jack-knifed across the road. The driver offloaded the tracked excavator and then went to get a nearby D8K crawler tractor in an attempt to pull the truck up the hill. The first attempt to pull the truck failed as the brakes on the trailer unit had not been disengaged and the chain from the crawler tractor to the truck tractor broke. The truck slid further downhill. While in the process of attaching a second chain, the crawler tractor backed over the driver. The brakes had not been set on the crawler tractor.

YEAR: 1998 FILE: 0895
OCCUPATION: Truck Driver AGE: 44
INDUSTRY: Mobile Equipment Operations, Road Construction Land Clearing and Demolition
EXPERIENCE: 10 years

DESCRIPTION: The truck driver had backed his tandem dump truck and trailer parallel to the working face of a gravel stockpile to load gravel. The stockpile of gravel was estimated to be nine metres high and the average size of gravel was about 50 millimetres. A front-end loader was parked at the base of the stockpile. The truck driver exited the vehicle and proceeded to the rear of the truck to secure the spreader chains. As the truck driver secured one of the spreader chains, a large portion of gravel sloughed down from the stockpile. The truck driver attempted to flee the immediate area by taking a path between the rear portion of the loader and trailer. The force of the descending gravel pushed the dump trailer sideways pinning the truck driver against the side of a parked front-end loader, resulting in death.

YEAR: 1998 FILE: 0910
OCCUPATION: Tow Tractor Operator/Truck Driver AGE: 43
INDUSTRY: Mobile Equipment Operations, Road Construction Land Clearing
EXPERIENCE: 29 years

DESCRIPTION: A construction crew was installing fibre optic cable in a ditch, 1.5 metres below ground, using a cable plow (a machine which threads cable underground). During the installation the crew approached an irrigation canal and roadway in their path. The crew had to stop plowing to disconnect the fibre optic cable from their plow. The procedure was to feed the cable through a previously installed conduit placed under the canal and roadway. A trench had to be dug alongside the cable plow to release the fibre optic cable. When the cable was released and uncoiled, they relocated the plow to the other side of the canal to receive the fibre optic cable.

A previously installed conduit was sticking out of the ground alongside the trench. Therefore, the trench that was dug to free the cable from the plow had to be offset and extended to expose the conduit. Once the conduit was exposed, the hi-hoe operator entered the trench and cut the conduit off at the 1.5 metre depth. While pulling the fibre optic cable through the conduit, it got caught.

The tow tractor operator entered the trench to realign the cable when the trench wall collapsed fatally injuring the operator.

YEAR: 1999 FILE: 0921
OCCUPATION: Caterpillar Operator AGE: 30
INDUSTRY: Mobile Equipment Operations
EXPERIENCE: 10 years +

DESCRIPTION: The caterpillar operator was excavating a dugout on a location owned by private individuals for the purpose of farming. It was equipped with a dozer blade and a single hydraulically controlled ripper tooth. The operator was using a ripper tooth to break up frozen ground. The ripper contacted a 410-millimetre pipeline, which transports sweet natural gas. The pipeline was punctured causing a release of natural gas. The gas ignited, causing an explosion and fire. The operator died as a result of burns received.

YEAR: 1999 FILE: 0924
OCCUPATION: Loader Operator AGE: 40
INDUSTRY: Mobile Equipment Operation
EXPERIENCE: 1 year with employer and several years previous experience

DESCRIPTION: The loader operator noticed a jam on the conveyor system carrying sludge into the burner at a pulpmill waste system. The loader operator called an electrician in the pulpmill informing the electrician that the heat shield at the end of the conveyor was jammed open, causing the belt to burn. A millwright was contacted and asked to come and make the necessary repairs. The millwright arrived and found that the loader operator had climbed the conveyor system in an attempt to fix the jam and became pinned by the lowered heat shield.

YEAR: 1999 FILE: 0937
OCCUPATION: Septic System Installer AGE: 50
INDUSTRY: Residential General Contracting, Construction and Renovations
EXPERIENCE: N/A

DESCRIPTION: The installer broke ground with a backhoe to prepare a trench for a septic tank. While digging the trench many cave-ins occurred. The walls collapsed enough to eventually change the trench into an excavation (the width exceeded the depth). The septic system installer was working alone and entered the excavation to conduct work on the outlet side of the tank. While working in the excavation, at least one wall collapsed, burying the installer.

YEAR: 1999 FILE: 0939
OCCUPATION: Truck Driver AGE: 58
INDUSTRY: Mobile Equipment Operations, Road Construction-NEC
EXPERIENCE: 11 years

DESCRIPTION: A truck driver was hauling concrete slabs from a private residence to a dry landfill site. At the dumping area within the landfill site, the truck driver raised the dump box to unload the concrete slabs. During unloading, one witness noticed a large concrete slab was "hung up" at the rear tailgate of the truck. The truck driver, after raising the load in order to dump, lowered the truck box and proceeded to the rear of the truck. The large concrete slab that was "hung up" on the tailgate suddenly dislodged. The large concrete slab along with others from inside the truck box fell on top of the truck driver resulting in fatal injuries.

YEAR: 2000 FILE: 0949
OCCUPATION: Cat Operator AGE: 33
INDUSTRY: Mobile Equipment Operations, Road Construction
EXPERIENCE: 10 years

DESCRIPTION: Two workers were connecting a brush rake, which weighed between 2,377 and 2,449 kilograms, to a D7H Caterpillar bulldozer. The brush rake was "face down" on the side of the road. In order to stand it up, a chain was connected from an eye on the upper middle back of the rake and around the C-frame on the bulldozer. The bulldozer operator raised the C-frame to its upper limits and reversed the cat to stand the brush rake up in order to pull the side arms out. When the blade was in a near upright position the helper signalled the operator to stop. The worker then walked in between the rake and the bulldozer and out of view of the operator. The bulldozer operator saw the bottom of the brush rake "kick out" and heard the other worker call for help. Upon getting out of the cab, the bulldozer operator found the worker pinned under the left arm of the brush rake. The worker was freed from the rake and first aid was administered and was transported to a hospital. The worker later died as a result of injuries sustained.

YEAR: 2000 FILE: 0970
OCCUPATION: Labourer AGE: 37
INDUSTRY: Mobile Equipment Operation
EXPERIENCE: N/A

DESCRIPTION: A labourer was working on stabilizing a building, which was gutted by fire. Bricks and mortar debris were covering the gas meter guard involved in this incident. The gas meter was protected by two guard posts and a cross brace; however, during clean up one of the guard posts was ripped out leaving one guard post and the cross brace in place. The cross brace was left only partially attached. The labourer requested that the skid steer loader operator remove the remaining gas meter guard. Using the loader bucket, the skid steer loader operator was unable to push the meter guard and re-positioned the loader. When the skid steer loader operator was pushing again, an upward thrust of the loader bucket broke the cross brace loose and it flew in the air striking the labourer in the head.

YEAR: 2000 FILE: 0982
OCCUPATION: Labourer AGE: 45
INDUSTRY: Pipeline Construction
EXPERIENCE: 5 days

DESCRIPTION: A trench was excavated with a bell-hole at the tie-in location of the two portions of the pipeline. The pipeline that was to be lowered into the trench consisted of additional weights to keep it in the appropriate position in the trench.

The crew lowered a portion of the pipeline towards another portion already lowered in the trench. The first of the two welds was completed. One worker had to lower the pipe while another worker was required to enter the trench to position the pipe horizontally so that the second weld could be completed. While the worker was laying the pipe in the trench, a clump of earth directly from above began to roll down the spoil pile into the trench and came to rest on top of the worker.

YEAR: 2001 FILE: 1003
OCCUPATION: Labourer AGE: 26
INDUSTRY: Pipeline Construction
EXPERIENCE: Minimal

YEAR: 2001 AGE: 25
OCCUPATION: Operator/Acting Foreman
INDUSTRY: Pipeline Construction
EXPERIENCE: Moderate

DESCRIPTION: Five pipeline workers had just completed stockpiling the 14th load of pipe, each pipe measuring 17.2 metres long and weighing 857 kilograms with a diameter of 32.4 centimetres. A new load arrived and the workers summoned the driver to park the truck/trailer adjacent to the 14th load of stockpiled pipe. The five workers approached the trailer to assist in unloading the 27 lengths of pipe. The operator/acting foreman and the labourer were on the driver's side of the trailer. The two removed the bungee cords securing the tarpaulins covering the load of pipe. The other three workers did the same. The driver exited the cab and loosened the tie down straps securing the load. A number of pipes rolled off the trailer and pinned the operator/acting foreman and the labourer against the adjacent load of stockpiled pipe. They were both transported to hospital where they were both pronounced dead.

YEAR: 2002 FILE: 1016
OCCUPATION: Serviceman Age: 38
INDUSTRY: Drilling, Horizontal or Angular
EXPERIENCE: 3 months

DESCRIPTION: A serviceman had been carrying out basic maintenance on a dump truck. The dump box was in the raised position. At some time the dump box descended from the raised position, trapping the serviceman's head and upper body between the dump box and the truck frame. A forklift had to be used to raise the dump box and the serviceman was taken to hospital and died some time later.

YEAR: 2002 FILE: 1025
OCCUPATION: Heavy Equipment Operator AGE: 49
INDUSTRY: Pipeline Construction
EXPERIENCE: 30 years

DESCRIPTION: Workers had just completed loading a D6R caterpillar dozer onto a low bed trailer. A worker was finishing an afternoon coffee break and had placed a lunch box on top of one of the trailer tires. The tractor-trailer driver walked past the workers and entered the cab of the tractor. The driver checked the passenger side mirror and saw workers standing in the ditch. As the tractor-trailer unit started moving forward the worker noticed the lunch pail on top of one of the dual wheels of the low bed trailer. The worker's right foot was pinned by one of the right dual wheels. The worker was forced to the ground and run over by the four right sets of trailer wheels. The worker died at the scene.

Note: There were eleven fatalities (three fatalities in 2000, three fatalities in 2001 and five fatalities in 2002) that are still under investigation.

7. Roofers

YEAR: 1998 FILE: 0903
OCCUPATION: Roofer AGE: 30
INDUSTRY: Siding, Soffit, and Eaves Trough Fabrication and Installation
EXPERIENCE: 11 years

DESCRIPTION: Two workers were installing eaves troughs on a row of three storey condominiums. The first worker descended a 12.0 metre aluminum extension ladder to retract the ladder and move it to a new location along the building. However, the co-worker, who was larger in stature, volunteered to move the ladder in the extended position to save time and effort. In order to move the ladder to the desired location, it was necessary for the worker to contend with a temporary ramp. As the worker was walking, the ladder contacted a live overhead power line resulting in fatal injuries.

YEAR: 2000 FILE: 0965
OCCUPATION: Labourer AGE: 31
INDUSTRY: Waterproofing, Industrial Coating Applications
EXPERIENCE: 1 year

DESCRIPTION: A worker was fabricating a second gate on a GYP Crete Pump that had been damaged through extended use. The gate could no longer maintain a seal and had to be replaced. The worker had obtained a scrap piece of plain carbon steel plate and placed it on top of a 205 litre drum, one-third full of asphalt primer. The worker proceeded to take a portable oxygen/acetylene cutting torch and cut into the steel plate. The cutting torch's flame intersected and punctured a hole in the drum. The steel plate began to arc and cut into the barrel. The cutting torch ignited the vapours inside the drum. The vapours expanded causing the drum to rupture, expelling the liquid contents on the worker and knocking the worker to the ground. The liquid contents ignited and a fire ensued.

Note: There were three fatalities (one fatality in 1998, one fatality in 2000 and one fatality in 2002) that are still under investigation.

8. Lime, Cement and Concrete Products Manufacturing

Note: There was one fatality in 1999 that is still under investigation

Appendices

Appendix A: Terms, Definitions and Formulas

Lost-Time Claim

A lost-time claim (LTC) is a claim for an occupational injury or disease, which disables the worker beyond the day of injury. Included are claims for which wages compensation are paid, permanent disability claims, fatalities and cases in which the injured worker is assigned light duties or other modified work upon return to work from time lost due to injury.

Person-Years

Person-year estimates are calculated from wage and payroll data provided by account holders to the WCB. Alberta Human Resources and Employment uses these data to estimate an average industry wage and uses the average industry wage and employer payroll data to estimate person-years worked for each employer and each industry. One person-year is equivalent to one full-time worker working for one year and can be assumed to equal 2,000 hours worked.

LTC Rate

The lost-time claim (LTC) rate is calculated by dividing the number of lost-time claims by the person-year estimate and multiplying the result by 100. The LTC rate represents the probability or risk of disabling injury or disease to a worker during a period of one-year work. Comparisons of LTC rates between industries or between years can be used to indicate increases, decreases or differences in this risk.

$$\text{LTC Rate} = \frac{\text{Number of LTCs} \times 100}{\text{Estimated Person-Years}}$$

Duration (Days Lost)

The duration of disability is the number of days following the injury or disease for which the worker was disabled and unable to perform normal work duties. This information is obtained for this report from data on compensation days paid on each claim from WCB. Alberta Human Resources and Employment obtains these data on March 31 of the year following the claim year and does not update the information, even though many injured workers continue to be disabled beyond this date. As a result, the duration information reported here underestimates the true impact of lost-time injury and disease.

Duration Rate

The duration rate is calculated by dividing the number of workdays lost (disability days) by the person-year worked estimate and multiplying by 100. The result is expressed as days lost per 100 person-years worked and indicates, in part, the economic impact of occupational injury and disease. Duration rates are not recommended as reliable indicators of full economic cost. In addition, readers are warned that duration rates are highly unstable when based on only a few lost-time claims; it is recommended that the duration rate not be calculated based upon fewer than 30 lost-time claims.

$$\text{Duration Rate} = \frac{\text{Disability Days} \times 100}{\text{Estimated Person-Years}}$$

WCB Accepted Fatality

An occupational fatality is the death of a worker which resulted from a work-related incident or exposure and which has been accepted by the WCB for compensation. A fatality is counted in the year it is accepted.

Fatality Rate

The fatality rate is calculated by dividing the number of accepted fatalities by the person-years worked estimate and multiplying the result by ten thousand. The result is expressed as fatalities per ten thousand person-years worked. Fatalities that are found under the jurisdiction of the Government of Canada are excluded before the calculation of the fatality rate.

$$\text{Fatality Rate} = \frac{\text{Number of Fatalities} \times 10{,}000}{\text{Estimated Person-Years}}$$

Number of Times Higher/Lower than the Provincial Average

The number of times higher/lower than the provincial average is used to compare the performance of the industries with that of the province regarding specific injury or disease. A number less than one indicates that the injury of the industries is lower than that of the provincial average; if equal to one it indicates the injury of the industries is the same as that of the provincial average and a number greater than one indicates that the injury of the industries is higher than that of the provincial average.

$$\frac{\text{Percent of Total Claims for the Industries} \times \text{Industries' LTC Rate}}{\text{Percent of Total Claims for the Province} \times \text{Provincial LTC Rate}}$$

Where:

Percent of Total Claims for the Industries =

$$\frac{\text{Number of LTCs for the Industries (e.g. back injury)} \times 100}{\text{Total LTCs for the Industries}}$$

Percent of Total Claims for the Province =

$$\frac{\text{Number of LTCs for the Province (e.g. back injury)} \times 100}{\text{Total LTCs for the Province}}$$

NEC

Means ‘Not Elsewhere Classified’.

UNS

Means ‘Unspecified’.

Appendix B: Business Rules

Lost-Time Claim Rate	The lost-time claim rate can only be considered reliable for employers with 40 or more person-years worked. It is recommended that the lost-time claim rate not be calculated based upon fewer than 40 person-years worked.
Duration Rate	Duration rate is highly unstable when based on a few lost-time claims. It is recommended that the duration rate not be calculated based upon fewer than 30 lost-time claims.
Percent	Percents may not add up to 100 because of rounding.
Description of ACSA Industries	The Alberta Construction Safety Association industries can be subdivided into the following Partners in Injury Reduction (PIR) groups of industries: Drywall and Residential Construction; Glaziers; Industrial Construction; Masonry; Mechanical Electrical Insulation; Roadbuilders; Roofers; and Lime, Cement and Concrete Products Manufacturing. For a complete listing of the industry codes for each group, see Appendix C.

Appendix C: Alberta Construction Safety Association 2002 Industry Codes

ACSA PIR Groups of Industries

1. Drywall and Residential Construction

Industry Codes:

02100 - Landscaping Including Maintenance
40401 - Construction, Residential
42111 - Painting and Decorating
42113 - Tile and Terrazzo, Sales/Installation
42115 - Paving Stone, Sales/Installation
42125 - Floor Covering, Sales/Installation
42133 - Cabinets and Counters, Assemble/Installation
42135 - Drywall, Plaster, Lath and Stucco, Sales/Installation
42136 - Underground Sprinklers, Sales/Installation/Service
42141 - Suspended Ceiling and Acoustic Materials, Assemble/Installation

2. Glaziers

Industry Codes:

30302 - Overhead Doors, Installation/Repair
42121 - Door and Window, Manufacturing/Installation

3. Industrial Construction

Industry Codes:

40400 - Construction and Industrial General Contracting
42105 - Prefabricated Steel Structures Erect/Removal
42106 - Structural Steel Erect
42109 - Stationary Machinery or Equipment, Install/Service
42120 - Sandblasting
42127 - Fence Sales, Rent, Installation
42129 - Industrial Plant Maintenance
42156 - Storage Tanks Erect/Dismantle
42159 - Piling, Caisson Operations and Foundation Boring
42161 - Precast Concrete Erect/Installation
51504 - Cathodic Protection Services
62302 - Machinery or Equipment-NEC, Sale/Service/Repair
86911 - Manpower Services- Industrial Labour
89401 - Welding
89605 - Service Station Equipment, Sales/Installation/Repair
89928 - Scaffolding and Tower Cranes, Rental/Erect

4. Masonry

Industry Codes:

42102 - Brick and Masonry Construction

5. Mechanical Electrical Insulation

Industry Codes:

31508 - Servicing (Only) of Overhead Cranes
42110 - Elevators and Escalators, Installation/Service
42117 - Heating, Ventilation, Air Systems, Installation/Service
42122 - Plumbing, Steam and Gas Fitting
42124 - Electrical Instrumentation Contracting
42144 - Fire Sprinklers Systems, Sales/Service/Installation
42184 - Mechanical Insulation, Installation/Service
89600 - Refrigeration Equipment, Sales/Service

6. Roadbuilders

Industry Codes:

02200 - Right-of-Way Maintenance, Industrial
34800 - Transit Mix Operations
40602 - Paving and Surfacing
40604 - Mobile Equipment Operations, Road Construction
40901 - Power Lines, Construction/Removal
40905 – Pipeline Construction
42103 - Drilling, Horizontal or Angular

7. Roofers

Industry Codes:

42155 - Moving of Buildings
42118 - Roofing
42139 - Waterproofing, Industrial Coating Applications
42151 - Siding, Soffit, Eaves Trough, Fabrication/Installation

8. Lime, Cement and Concrete Products Manufacturing

Industry Codes:

42104 - Concrete Construction

For Further Information Contact:

Alberta Human Resources and Employment
Data Development and Evaluation
2nd Floor, 10808 – 99 Avenue
Edmonton, Alberta
T5K 0G5

Phone: 780-427-8531, toll free by calling 310-0000
Fax: 780-422-5070

Alberta Human Resources and Employment website:
http://www.gov.ab.ca/hre

Alberta Workplace Health and Safety website:
http://www.whs.gov.ab.ca

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